

Work Order ID 99106

99106

Page 1

March-28-13 12:46:40 PM

Item ID: D3884-1

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Saddle, Inboard LH

Start Date: 3/21/13 Start Qty: 8.00

8

Cust Item ID:

Required Date: 3/27/13 Req'd Qty: 8.00

8

Customer:

Reference:

Approvals: Process Plan: ML5 Date: 3-03-28 Tooling:

Date:

Run Start *NR1*

QC: Date: SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D3884

B

100

0.00

100

HAAS 1

HAAS CNC VERTICAL MACHINING #1

Memo

0.00

HAAS CNC vertical machine #1

Program Batch No. 99106

Double check by: 11

1-Machine Step No 1 per Folio FA818 and inspect per attached Dimension Sheets

2-Machine Step No 2 per Folio FA818 and inspect per attached Dimension Sheets

3-Machine Step No 3 per Folio FA818 and inspect per Dimension Sheets

ML/ 3-04-21

9

0

Pto

110

QC2- Inspect parts off machine FAI/FAIB

0.00

110

QC

Memo

0.00

Quality Control

ML/ 3-04-21

9

0

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: dh Date: 13/05/25QA Closed: cl Date: 13/5/22

Work Order: <u>99106</u> Part No. <u>D3884-1</u> NCR No. <u>13-2646</u>	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input checked="" type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input checked="" type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input checked="" type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data <input type="checkbox"/>	13-04-20	100	1	groove is under tolerance by .003", The minimum tolerance is .215" & Part has .210"	A.P. 13.05.07	Made an extra one <u>B 94444</u> .Part with 0.214 groove is acceptable .Part with 0.210 THK groove acceptable per attached	13-04-20 A.P. 13.05.07 A.P. 13.05.07	13/05/18 13/05/18 13/05/18	13/05/10
Equip/Tooling <input type="checkbox"/>									
Operator <input checked="" type="checkbox"/>									
Material <input type="checkbox"/>									
Setup <input type="checkbox"/>									
Other <input type="checkbox"/>									
Process <input type="checkbox"/>									
Supplier <input type="checkbox"/>									
Training <input type="checkbox"/>									
Unapproved <input type="checkbox"/>									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio	<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions
---	---	---

<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	---

Work Order ID 99106

99106

Page 2

March-28-13 12:46:40 PM

Item ID: D3884-1

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Saddle, Inboard LH

Start Date: 3/21/13 Start Qty: 8.00 *8*

Cust Item ID:

Required Date: 3/27/13 Req'd Qty: 8.00 *8*

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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120 QC8- Inspect parts - second check 0.00

120

QC

Memo

Quality Control

0.00

B.A 13/05/09

9

0

DAS
08
9-89

130 Chemical Conversion Coat per QSI005 4.1 0.00

130

HandFinish

Memo

Hand Finishing

0.00

9x0 m/f 13/05/13

140 White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum 0.00

140

Powdercoat

Powder Coating

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

3:45
320 OF
4:15

0.00

9x0 m/f 13/05/14

m125620

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>
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Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY

Landing Gear	General	Other
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Misabeled
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions
		<input type="checkbox"/> Ovalized
		<input type="checkbox"/> Over/Under tolerance
		<input type="checkbox"/> Part Incorrect
		<input type="checkbox"/> Part Lost/Missing
		<input type="checkbox"/> Part Moved
		<input type="checkbox"/> Positioned Wrong
		<input type="checkbox"/> Power Loss/Surge
		<input type="checkbox"/> Pressure/Forced
		<input type="checkbox"/> Temperature/Cure
		<input type="checkbox"/> Weld
		<input type="checkbox"/> Wrong Stock Pulled
		<input type="checkbox"/> Other

Work Order ID 99106

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99106

Page 3

Item ID: D3884-1

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Saddle, Inboard LH

Start Date: 3/21/13 Start Qty: 8.00

8

Cust Item ID:

Required Date: 3/27/13 Req'd Qty: 8.00

8


Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150	QC3- Inspect Part Finish	0.00				9	6	13-5-15	
150									
QC	Memo	0.00							
Quality Control									
160	Identify as per dwg & Stock Location: <u>8429</u>	0.00							
160									
Packaging	Memo	0.00							
Packaging									
170	QC21- Final Inspection - Work Order Release	0.00							
170									
QC	Memo	0.00							
Quality Control									

(9x) 13/5/16 sf

13/5/21

ML5 13-05-16

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data <input type="checkbox"/>									
Equip/Tooling <input type="checkbox"/>									
Operator <input type="checkbox"/>									
Material <input type="checkbox"/>									
Setup <input type="checkbox"/>									
Other <input type="checkbox"/>									
Process <input type="checkbox"/>									
Supplier <input type="checkbox"/>									
Training <input type="checkbox"/>									
Unapproved <input type="checkbox"/>									

FAULT CATEGORY

Landing Gear	General	Other
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Mislabeled
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions
		<input type="checkbox"/> Ovalized
		<input type="checkbox"/> Over/Under tolerance
		<input type="checkbox"/> Part Incorrect
		<input type="checkbox"/> Part Lost/Missing
		<input type="checkbox"/> Part Moved
		<input type="checkbox"/> Positioned Wrong
		<input type="checkbox"/> Power Loss/Surge
		<input type="checkbox"/> Pressure/Forced
		<input type="checkbox"/> Temperature/Cure
		<input type="checkbox"/> Weld
		<input type="checkbox"/> Wrong Stock Pulled
		<input type="checkbox"/> Other

Picklist Print

March-28-13 12:46:40 PM

Page 1

Work Order ID: 99106

Parent Item: D3884-1

Parent Item Name: Saddle, Inboard LH

Start Date: 3/21/13

Required Date: 3/27/13

Start Qty: 8.00

Required Qty: 8.00

Comments: IPP RevA: New issue DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6101-017 Saddle Billet		Manufactured	No				Each	32.0000		9 8		13-04-20	

Location

Loc Qty

Loc Code

MAT040

32

→ 94444

20

94695

12

8 + 1 13-04-20 13/04/18

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY

Landing Gear	General	Other
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Mislabeled
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions
		<input type="checkbox"/> Ovalized
		<input type="checkbox"/> Over/Under tolerance
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		<input type="checkbox"/> Part Lost/Missing
		<input type="checkbox"/> Part Moved
		<input type="checkbox"/> Positioned Wrong
		<input type="checkbox"/> Power Loss/Surge
		<input type="checkbox"/> Pressure/Forced
		<input type="checkbox"/> Temperature/Cure
		<input type="checkbox"/> Weld
		<input type="checkbox"/> Wrong Stock Pulled
		<input type="checkbox"/> Other

DART AEROSPACE LTD		Work Order:	99106
Description: Saddle, Inboard, LH		Part Number:	D3884-1
Inspection Dwg: D3884	Rev: B	Page 1 of 1	

Inspect dimensions highlighted on inspection sheet drawing and record below:

Dim	Min	Max	Go/No Go Gauge	Recorded Actual Dimensions				By	Date
				1	2	3	4		
A	2.870	2.880		2.875	2.875	2.875	2.875		
B	1.433	1.443		1.438	1.438	1.438	1.438		
C	0.638	0.658		.646	.646	.646	.646		
D	3.895	3.905		3.900	3.900	2.900	2.900		
E	0.257	0.262		.258	.258	.258	.258		
F	0.605	0.625		.614	.614	.614	.614		
G	1.120	1.130		1.126	1.126	1.126	1.126		
H	2.245	2.255		2.250	2.250	2.250	2.250		
I	2.000	2.020		2.000	2.000	2.000	2.001		
J	0.140	0.175		.151	.156	.143	.143		
K	1.265	1.285		1.265	1.265	1.265	1.265		
L	0.115	0.135		.126	.126	.126	.126		
M	0.240	0.260		.250	.249	.250	.249		
N	0.110	0.140		.140	.140	.140	.140		
O	0.240	0.260		.254	.253	.253	.254		
P	2.826	2.886		2.864	2.864	2.864	2.864		
Q	0.178	0.198		.188	.188	.188	.188		
R	0.140	0.165		.156	.156	.155	.155		
S	0.720	0.780		.760	.760	.760	.760		
T	1.220	1.280		1.270	1.265	1.265	1.265		
U	1.245	1.255		1.250	1.248	1.250	1.250		
V	5.990	6.010		6.001	6.001	6.000	6.000		
W	2.495	2.505		2.500	2.500	2.498	2.498		
X	0.490	0.510		.500	.495	.495	.497		
Y	0.020	0.040		.035	.035	.035	.035		
Z	0.313	0.318		.314	.314	.314	.314		
AA	0.760	0.765		.760	.760	.760	.760		
AB	0.215	0.220		.220	.218	.220	.218		
AC	0.316	0.321		.316	.316	.316	.316		
AD	1.745	1.755		1.750	1.750	1.750	1.750		
AE	0.990	1.010		1.005	1.000	1.000	1.000		
AF									
Accept/Reject									

Measured by:	OK / H
Date:	13/04/19 / 13-04-20

Audited by:	J.A.	DAS
Date:	13/05/09	08 9-89

Rev	Date	Change	Revised by	Approved
A	09.10.22	New Issue	KJ	

DART AEROSPACE LTD		Work Order: 99106
Description: Saddle, Inboard, LH		Part Number: D3884-1
Inspection Dwg: D3884	Rev. B	Page 1 of 1

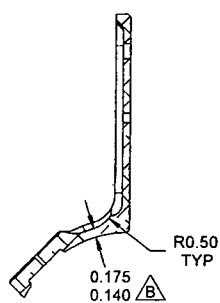
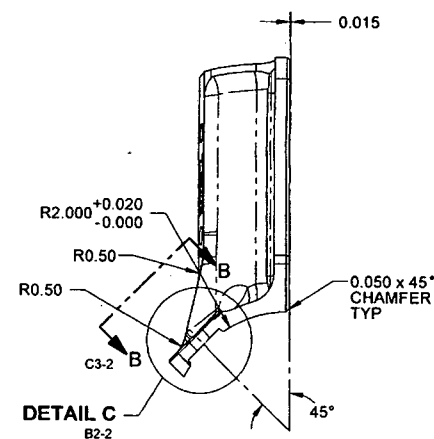
Inspect dimensions highlighted on inspection sheet drawing and record below:

Dim	Min	Max	Go/No Go Gauge	Recorded Actual Dimensions				By	Date
				15	16	17	18		
A	2.870	2.880		2.875	2.875	2.875	2.875		2.875
B	1.433	1.443		1.438	1.438	1.438	1.438		1.438
C	0.638	0.658		.648	.648	.648	.648		.648
D	3.895	3.905		3.900	3.900	3.900	3.900		3.900
E	0.257	0.262		.258	.258	.258	.258		.258
F	0.605	0.625		.614	.614	.614	.615		.615
G	1.120	1.130		1.125	1.125	1.125	1.125		1.125
H	2.245	2.255		2.250	2.250	2.250	2.250		2.250
I	2.000	2.020		2.001	2.001	2.001	2.001		2.0015
J	0.140	0.175		.143	.143	.144	.142		.142
K	1.265	1.285		1.2652	1.2653	1.2652	1.2654		1.266
L	0.115	0.135		.126	.126	.125	.124		.125
M	0.240	0.260		.250	.250	.256	.248		.249
N	0.110	0.140		.140	.140	.140	.140		.140
O	0.240	0.260		.254	.254	.254	.256		.256
P	2.826	2.886		2.865	2.865	2.865	2.865		2.865
Q	0.178	0.198		.188	.188	.188	.188		.188
R	0.140	0.165		.151	.150	.150	.151		.148
S	0.720	0.780		.760	.760	.760	.760		.760
T	1.220	1.280		1.270	1.270	1.270	1.270		1.270
U	1.245	1.255		1.250	1.249	1.249	1.248		1.248
V	5.990	6.010		6.000	6.000	6.000	6.000		6.000
W	2.495	2.505		2.501	2.499	2.500	2.499		2.500
X	0.490	0.510		.495	.496	.496	.497		.497
Y	0.020	0.040		.035	.035	.035	.035		.035
Z	0.313	0.318		.314	.314	.314	.314		.314
AA	0.760	0.765		.760	.760	.760	.760		.760
AB	0.215	0.220		.219	.219	.219	.219		.219
AC	0.316	0.321		.316	.316	.316	.316		.316
AD	1.745	1.755		1.748	1.751	1.750	1.747		1.749
AE	0.990	1.010		1.000	1.000	1.000	1.000		1.001
AF									
Accept/Reject									

Measured by:	AK
Date:	13/04/19 / 13-04-20

Audited by:	B-a
Date:	13/05/09

Rev	Date	Change	Revised by	Approved
A	09.10.22	New Issue	KJ	

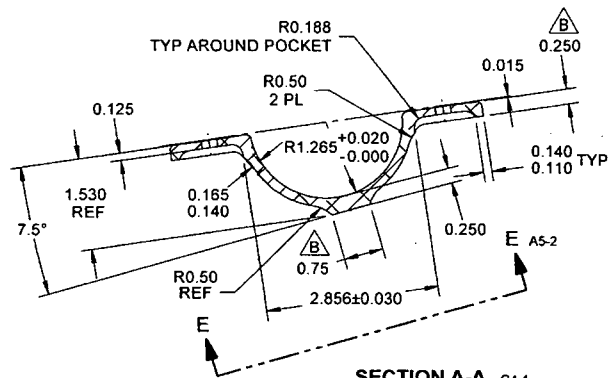
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RELEASE
09/07/15

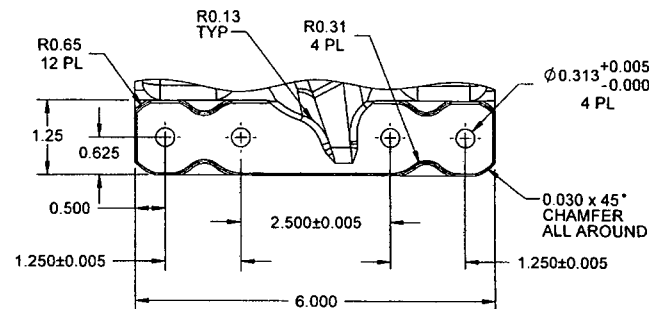
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- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
POWDER COAT "WHITE" (4.3.5.1) PER DART QSI 005 4.3
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: ENGRAVE PART AND BATCH NUMBER IN THIS AREA TO
MAX. DEPTH OF 0.010 WITH A MIN. TOOL RAD OF R0.010
- 7) WEIGHT: 0.71 lbs

W/O 99106

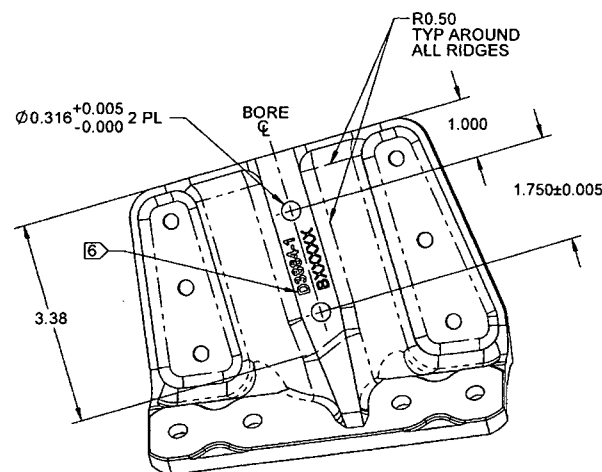
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A	NEW ISSUE		RF	09.03.30
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DATE	09.06.30			



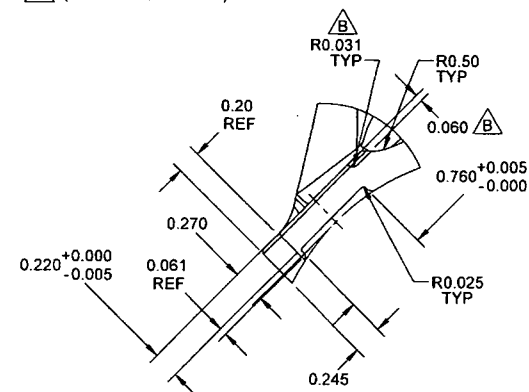
SECTION A-A C4-1



VIEW B-B B3-1
(ROTATED FOR CLARITY)






VIEW E-E C6-2



DETAIL C B3-1
SCALE 2X

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5.4.2 Bearing Analysis

$Abs := Dx \cdot tx$	$Abs = 0.08 \cdot in^2$	
$Fbs := Fbru3 \cdot Abs$	$Fbs = 10428 \cdot lb$	Bearing Allowable
$MS16b := \frac{Fbs}{Pt \cdot ff} - 1$	$MS16b = 1.3$	Margin of Safety

5.5 Saddle to Crosstube Fastener Analysis (Mx)

The following calculation determines the maximum rotational moment (Mx) to be resisted by the attachment of the saddles to the crosstube. See Figure 10 in Reference 1.

$Lz := 5.94 \cdot in$		Vertical distance from center of saddle to crosstube fastener pattern to Py (Max. Side Load)
$Mx := Py \cdot Lz$	$Mx = 11630.99 \cdot lb \cdot in$	Maximum Rotational Moment
$Ft := \frac{Mx}{Lt}$	$Ft = 6646.28 \cdot lb$	Tensile load in saddle to crosstube fasteners
$MS16c := \frac{FtuMS2125005}{Ft \cdot ff} - 1$	$MS16c = 0.45$	Margin of Safety

5.6 Saddle to Skidtube Fastener Comparison (Px)

Dart saddles are held onto the skidtube with qty of (4) AN3 bolts and D2652 stainless steel bushings. The following calculations demonstrate that the Dart Saddle design can resist the Drag Loads (Px). Note that the Px loads are reacted by the saddle fasteners and My/Pz will be reacted by the interlocking ridge as outlined in Section 5.8.5 of this report.

5.6.1 Fastener Analysis

The strength of the bolt and bushing combination is calculated as follows:

$Db := 0.191 \cdot in$		D2652 stainless steel bushing hole size
$Fsbush := 50000 \cdot lb \cdot in^{-2}$		Bushing material shear strength (Ref. 3 Pg. 5)
$Abush := \frac{\pi}{4} (Df^2 - Db^2)$	$Abush = 0.048 \cdot in^2$	Bushing area
$Fbush := Fsbush \cdot Abush$	$Fbush = 2414.63 \cdot lb$	Bushing allowable shear force
$Ffast := Fbush + FsuAN3$	$Ffast = 4539.63 \cdot lb$	Total shear force through bolt and bushing
$Fx := Ffast \cdot nt$	$Fx = 36317.02 \cdot lb$	Total allowable Drag Load
$MS17a := \frac{Fx}{Px \cdot ff} - 1$	$MS17a = 7.1$	Margin of Safety

5.6.2 Bearing Analysis

$Abs := Df \cdot ts$	$Abs = 0.05 \cdot in^2$	Skidtube bearing area
$Fx := Fbru1 \cdot Abs \cdot nt$	$Fx = 30799.2 \cdot lb$	Total allowable Drag Load
$MS17b := \frac{Fx}{Px \cdot ff} - 1$	$MS17b = 5.8$	Margin of Safety

skidtube will fail in bearing before saddle

5.7 Saddle to Skidtube Ridge Analysis (Mx)

The interlocking ridge on the outside of the Dart skidtube resists Mx rotation down the skidtube.

$As := (wf \cdot Ld - \pi \cdot Df^2) \cdot 2$	$As = 8.5 \cdot \text{in}^2$	Shear area of skidtube ridge
$Fskid := Fsu1 \cdot As$	$Fskid = 221115.51 \cdot \text{lb}$	Force to shear skidtube ridge
$Ar := tover \cdot Ld \cdot 2$	$Ar = 2.94 \cdot \text{in}^2$	Shear area of saddle ridge
$Fsad := Fsu4 \cdot Ar$	$Fsad = 114660 \cdot \text{lb}$	Force to shear saddle ridge

The fasteners that secure the Agusta saddles to the Agusta skidtube resist Mx rotation down the skidtube.

$Fscrew := na \cdot FsuAN4$	$Fscrew = 66240 \cdot \text{lb}$	Agusta allowable shear force
$Bua := (na \cdot Da) \cdot Fbru4 \cdot tmat$	$Bua = 91962 \cdot \text{lb}$	Agusta allowable bearing force (ultimate)

Therefore, the critical aspect of the Dart saddle configuration is shear failure of the saddle ridge and the critical aspect of the Agusta saddle configuration is shear failure of the attachment screws.

$MS18 := \frac{Fsad}{Fscrew} - 1$	$MS18 = 0.73$	Margin of Safety
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5.8 Saddle Material Strength Comparison (Px, Py, Pz)

The calculations in this section of the report demonstrate that the Dart saddles have superior structural capability vs the Agusta saddles in the Px, Py, and Pz directions. The allowable loads of the Dart saddles are much higher than the values of Px, Py, and Pz calculated in Section 5.3.

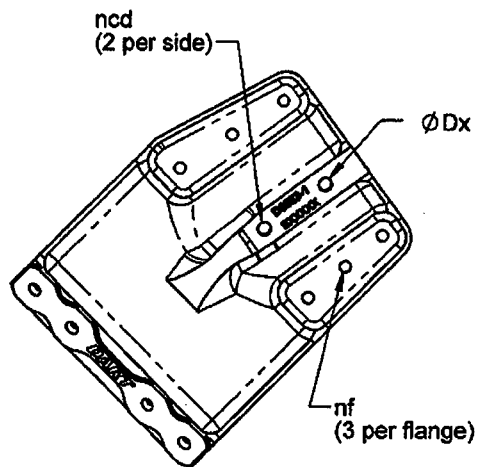
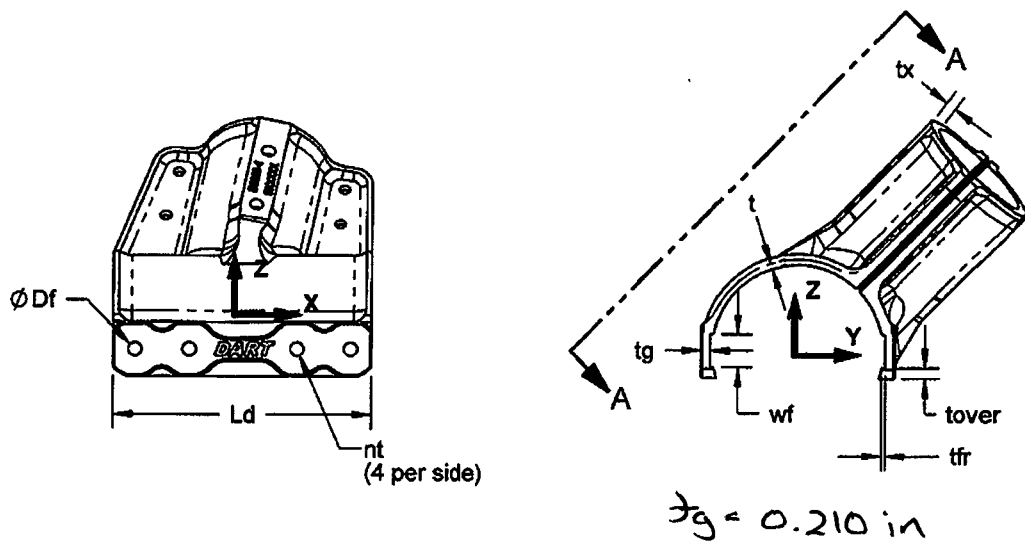
$Ad1 := 0.94 \cdot \text{in}^2$	Cross section area of saddle at Section D-D (see Reference 1 page 5)
$Ad2 := 1.04 \cdot \text{in}^2 = 0.998$	Cross section area of saddle at Section E-E (see Reference 1 page 5)
$Ad3 := 1.12 \cdot \text{in}^2$ $Ad2 > Ad1$	Cross section area of saddle at Section C-C (see Reference 1 page 5)
$Aa := \frac{\pi}{4} \cdot (Doa^2 - Dia^2) - 2 \cdot (tmat \cdot Da)$ $Aa = 1.25 \cdot \text{in}^2$	Area of Agusta saddle in tension/comp/shear at Section F-F (see Reference 1 page 6)

\therefore Critical section is D-D \therefore Part O.K.

5.8.1 Ultimate Tensile Strength (Pz)

The critical section is Section D-D (Ad1). Therefore the following comparisons will be between Section F-F of the Agusta saddle (Aa) and Section D-D of the Dart saddle (Ad1).

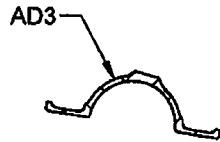
$Ftud := Ftu3 \cdot Ad1 \cdot 2$	$Ftud = 118440 \cdot \text{lb}$	Dart allowable force for Ad1 (ultimate)
$Ftub := Ftu4 \cdot Aa$	$Ftub = 82337.59 \cdot \text{lb}$	Agusta allowable force (ultimate)
$MS19 := \frac{Ftud}{Ftub} - 1$	$MS19 = 0.44$	Margin of Safety



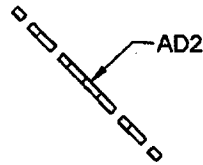
SECTION A-A

Figure 3. - Dart Saddle Geometry

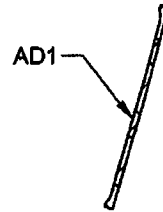
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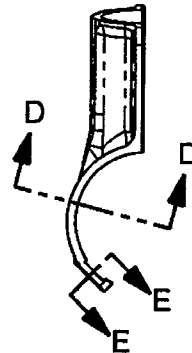
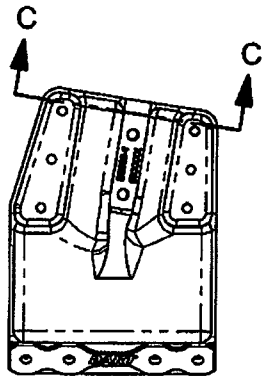
SECTION C-C



SECTION E-E



SECTION D-D



AD1 = 0.94 in²
 AD2 = 1.04 in²
 AD3 = 1.12 in²

} From AutoCAD AD2 = 0.998

Figure 5. - Dart Saddle Cross Section Areas

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